EINSTEINIAN SPACE AND THE PROBABLE NATURE OF BEING.

AN ADVENTURE IN METAPHYSICS.

THE achievement of Professor Einstein of Leipzig University, after long and thorough discussion, is recognized by science as the greatest feat in pure mathematics as yet accomplished by the human mind; though, as is to be expected, the ultimate validity of all of his conclusions does not enjoy quite the same status.

That he was anticipated in some respects by Oriental philosophers a thousand years before Christ does not detract from his own work, which was carried out independently, from different bases and by different methods.

We will not deal here with the mathematical mechanism of his work, which is of the nature of calculus of a very advanced form, and which it is said is understandable to only a dozen men in the world; but will deal with certain consequences and some possible interpretations therof.

The most important consequence is the concept of time as a fourth dimension of space. We are familiar with the common mathematical representation of the three dimensions of space; length, breadth, and thickness. These dimensions are represented by three lines, each at right angles with the two others. The possibility of a fourth dimension, representable by a line at right angles with all three of our present axes (a condition inconceivable to the human mind), has long been discussed.

Einstein seems to show that this fourth dimension actually exists, being none other than our familiar, but incomprehensible entity, time itself. In other words, the illusion of time proceeds from a translation of the observing entity through the true four-dimensional space, the events passed through remaining unchanged and permanent in position in true space. By a rigid mathematical demonstration, he shows that the axes by which any given observer locates and orients himself in time and three dimensional space (that is, in true space), may be made to coincide with any other set of axes by a simple process of rotation; concretely, time may proceed in one direction in one part of the universe, and in some other direction in another part, simultaneously. The inevitable deduction is the eternal coexistence of all things in a universe whose component parts are changeable only in their time-space relationships.

In our three-dimensional space, the path of a particle forms a line representable by its projections on the planes determined by the three axes of reference. In Einsteinian space the same rule holds good, but the concept must be extended to include a projection on the additional plane postulated by the existence of the time-dimension. This projection is what appears to us as the passage of an entity through events. The true and unique path of the entity through time-space is termed by Einstein the "world-line."

Since two entities can contact one another only when they meet in both time and space, a meeting of entities implies an exact intersection of their respective world-lines. If a human mind becomes conscious of any other entity, of any nature whatsoever, it can only be because the world-line of that mind intersects that of the other entity in time-space at that particular point.

Let us leave this development for the moment.

Einstein assumes (and seems to prove) that energy is affected by gravitation. In fact, if matter is a form of

energy, this must be the case; and modern research tends more and more to that hypothesis.

If this be so, then all things are subject to the influence of gravitation, since, giving the term its widest possible meaning, nothing exists save energy and its modification, matter.

Calculating upon this basis, Einstein correctly predicted certain astronomical phenomena; and other possible confirmations are still under test.

A hypothesis in good standing at the present time is that of the curvilinear nature of space. I cannot say just what its origin is, or what relation it bears to the more general aspects of Einstein's theory, so must leave the discussion of its validity to deeper students, while presenting for what it may be worth, a hypothesis erected thereupon.

From here we will attack the problem of being with three assumptions: time as a dimension of true space, all existing things as modifications of energy, and the curvilinear nature of space.

It is not illegitimate to consider consciousness and its activities as forms of energy; in fact, it is not conceivable that they can be anything else. From this we may imagine that the matrix of consciousness, which we will term Being for convenience, is a form of that which manifests as material phenomena, or matter and energy. Let us go another step and consider that Being is the original and primal substance of the universe, capable of that movement or modification which we term consciousness; and that consciousness manifests only upon some manner of contact; including in the word contact all forms of sensation, mentation, etc.

Thus the only distinction between a conscious and an unconscious entity would be in the nature of their respective contacts; and not at all in their essential substances.

Thus the substance of Being in the atoms of a stone appears as unconscious to the perceiving mind simply because the world-line of the mind intersects the world-lines of the atoms of the stone at such angles that contact with the mind does not arouse consciousness within the Being stuff of the stone.

It will be noted that on this hypothesis we must define the atoms of the organs of perception as belonging, during the process of perception, not to the mind-combination, but to the stone-combination; and we must imagine the mind as looking on at the process of perception, but not taking part therein.

As a matter of experiment, let us drop all preconceived ideas, and start afresh with the only statement of whose truth we can be sure, in the ultimate meaning of the word: "I think, therefore I am." Let us follow this with the next most reasonable hypothesis: we think only when stimulated by contact; a single mind in the universe however potentially conscious it might be, would never develop actual consciousness; therefore something more than the I which thinks must also exist. Let us add another reasonable hypothesis: that the ultimate laws of nature are probably of the utmost simplicity.

Now we have: A certain sure fact and two reasonable assumptions:

First: I am.
Second: Something else is.
Third: The ultimate law of That Which Is is simplicity.

And three apparent facts:

First: Four-dimensional space, time as one of the dimensions.

Second: Space is curved.

Third: All is of one nature, possibly energy, say Being.

It will be noted that number three of the second series would follow from three of the first series; and we will show that the second of the second series would also follow from it. It might also be said that the first of the second series comes in this category as well, for time as an integral dimension of space is surely a simpler idea than time as a separate, unrelated, and altogether unknown thing.

Reasoning from the postulate of simplicity, let us take our bases in order.

The utmost simplicity of Being would lie in the existence of a single entity in the universe; but we have seen that more than one entity exists, and we may as well admit at once that an infinite number may exist, for infinite multiplicity, from the philosophical standpoint, is just as simple as duality. So let us fall back upon the next most simple assumption: that the component entities of the universe are exactly alike in all their qualities, and that all are like particles of the stuff of Being itself. Term these entities monads. As to their nature, it must for the present remain purely metaphysical; they certainly must be some more primitive manifestation even than electrons; perhaps an electron may be made up of thousands of monads. Note that each monad is potentially conscious, containing all the possibilities of sensation and mentation, possibilities which become actualities only upon contact with other monads.

The path of each monad through time-space, must, from simplicity, have the same form of equation as that of any other monad. The simplest equation is that of a straight line. For the time being, then, let us imagine the world line of each monad as a straight line; we shall see later that

a straight line is the simplest form only from the standpoint of three dimensional space.

To get at the nature of space from the assumption of simplicity, we may reason thus: three-dimensional space is either limited or unlimited: if limited the simplest form is seen at once to be a sphere.

If three-dimensional space is unlimited, then the form of four dimensional space is the metasphere whose shadow in three-dimensional space is the sphere; for unlimited space is that in which a line of unlimited length may be produced in any direction, and if three-dimensional space is considered as the surface of metaspherical four-dimensional space, this holds good, since the simplest form of a line in the surface of a sphere is a circle, which is endless.

To our three-dimensional senses, such a circle would appear as a straight line as far as seen, since our only criterion of straightness would be such a circle itself.

Of course, if three-dimensional space is curved, the simplest form of curvature would be the surface of the metasphere. As an additional support to the curvilinear theory, it will be noted that the human mind can make some approach to the idea of the fourth dimension by its aid, and none at all without it.

It will be noted incidentally that if three-dimensional space is in the form of a metaspherical envelope, our conception of space has nothing at all to do with the true extension of space; space may be of infinite extent or of infinitesimal extent, using the words in their usual meaning. It may be even non-existent to all human conceptions.

Using the idea of an infinite number of similar monads following an infinite number of similar paths, let us bring the conception down to our level by subtracting a dimension from each of our factors, so to speak, thus imagining ourselves as animals conscious only in a surface.

Then we have for true space, a sphere; for our per-

ceptible space, the surface of that sphere; for the monadic world-lines, circles inscribed in that surface, and for the monads, beings capable of contracting one another only when their circles intersect.

The monads move; otherwise there would be no manifestation; the "I" could not think. The simplest form of motion is uniform motion in a straight line; but the straight line of three-dimensional space is the circle on the surface of the metasphere. So we have the monads in uniform motion along the circles inscribed on the surface of our sphere. By simplicity, each circle would be a great circle of the sphere. An infinite number of great circles may be drawn for any sphere, intersecting in an infinite number of points at an infinite number of angles.

Therefore any one monad, starting from a point and returning thereto, might experience any given number of contacts in the course of its cycle. Any experience which a monad undergoes would be the integration of the contacts experienced at that point in time-space, and its nature would be determined by the number of other monads taking part in the meeting, and the angles of intersection of their world-lines. All events, of course, would be absolutely cyclic, recurring as often as the monads completed their circles. We are struck here by the fact that the greater number of events perceptible in nature really are cyclic; and it is reasonable to suppose that such as do not appear so to us, do not so appear, simply because we cannot see enough of the arc to perceive its circular nature.

Thus we have a hypothesis by which the simplest form of Being, following the simple form of path, in the simplest form of space, gives rise to all the visible phenomena of our universe.

There are innumerable consequences to this hypothesis, upon some of which we will touch.

First, immortality would be an absolute fact, whatever the nature of the soul might be, for all things would be periodically reconstituted. However, in order to satisfy the emotional desires of the normal mind, it would be necessary to prove that the periodical existence of the soul is of greater scope than that seen in our present lives. This, however, might well be the case, as the above seems to demonstrate our absolute present ignorance of true reality.

Second, all experiences and existences perceptible to us, must in the philosophical sense of the word, be pure illusion, owing their apparent orderly sequence to some geometrical pattern in the arrangement of the monadic world-lines; a pattern which it is reasonable to suppose would be of utmost simplicity in some way.

A simple syllogism furnishes an added piece of evidence as to the cyclic nature of Being.

Something cannot arise from nothing; something now exists, therefore something always has existed. That which exists undergoes constant change; if the changes led to any fixed culmination, that culmination would have been reached in the course of past eternity, and no changes would now be taking place. By all our known laws, all the energy in the universe would have flown to a dead level, and all things would now be motionless and consolidated in a single dead mass.

If all movement is not cyclic, some power must have interposed to reverse the current of events, to change for a time the laws of nature. This conception is repugnant, and not to be compared with that of a cyclic universe with immovable and unchangeable contents and laws.

Now, the reader has probably observed that we are standing on the edge of a gulf into which it is not well for the human mind to look too long; for the periodical nature of manifestation implies a thing which bears the same

relation to four-dimensional space which time bears to three-dimensional space, and so on *ad infinitum.*

With this observation we return to the world of sanity and normal mentation, leaving to bolder and better equipped minds the further development of the idea.

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